CIVIL QUALITY CONSULTANTS & ENGINEERS
ISO 9001:2015 Certified & NABL Accredited Laboratory as per ISO/IEC - 17025-2017

Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date : : 07.01.2021

GRADATION FOR WMM

Client : **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency : **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work : Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
IS Code: : IS 2386 (Part 1):1963(RA 2011)
Date of Testing : 07.01.2021
Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	241	241	2.4	97.6	95-100
22.4	2538	2779	27.8	72.2	60-80
11.2	2169	4948	49.5	50.5	40-60
4.75	1647	6595	66.0	34.1	25-40
2.36	1153	7748	77.5	22.5	15-30
0.600	526	8274	82.7	17.3	8-22
0.075	1273	9547	95.5	4.5	0-5

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Authorised Signatory

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date : : 07.01.2021

GRADATION FOR WMM

Client : **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency : **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work : Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
IS Code: : IS 2386 (Part 1):1963(RA 2011)
Date of Testing : 07.01.2021
Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	234	234	2.3	97.7	95-100
22.4	2315	2549	25.5	74.5	60-80
11.2	2069	4618	46.2	53.8	40-60
4.75	1618	6236	62.4	37.6	25-40
2.36	1175	7411	74.1	25.9	15-30
0.600	624	8035	80.4	19.7	8-22
0.075	1562	9597	96.0	4.0	0-5

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date: 07.01.2021

Aggregate Impact Value

Client	**: Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
IS Code	IS 2386 (Part 4):1963(RA 2011)
Type of Mix	Wet Mix macadam
Date of Testing	07.01.2021

Sl No.	Details	Test No. 1	Test No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	83	81	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	307	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.50	20.88	21.19

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%(As per MORTH Specication table 400.12)

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date : 07.01.2021

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	: **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
BIS code:	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	07.01.2021

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 400.12
1	Flakiness Index %	10.4	11.8	Combined Flakiness & Elongation index Max 35%
2	Elongation Index %	11.3	10.6	
	Combined Flakiness & Elongation index	21.70	22.4	

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date 09.01.2021

ATTERBERG LIMITS TEST FOR WMM

Client : **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency : **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work : Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
IS Code: IS 2720(Part 5):1985
Date of Testing : 07.01.2021 to 09.01.2021
Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	18.55	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021

Date 09.01.2021

ATTERBERG LIMITS TEST FOR WMM

Client : **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency : **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work : Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
IS Code: IS 2720(Part 5):1985
Date of Testing : 07.01.2021 to 09.01.2021
Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	18.55	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-21

Date: 16.01.2021

TEST REPORT

Client	:	**: Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency	:	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the work	:	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	16.01.2021

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	55	Min 45
2	Softening point, ^{0}C	63	Min. 47
3	Ductility at 27^{0}C, cm	> 100	Min. 40
4	Flash Point, ^{0}C	279	Min. 220

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 16.01.2021

Aggregate Impact Value

Client	**: Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
BIS Code	:IS 2386(Part 4):1963
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.01.2021

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	384	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	87	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297	293	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.66	23.30	22.98

Comments:
→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021

16.01.2021

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	: **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	16.01.2021

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	10.7	12.1	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	11.7	10.5	
	Combined Flakiness & Elongation index	22.40	22.60	

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 18.01.2021

Specific Gravity And Water Absorption Test

Client	**: Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
BIS Code	:IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	16.01.2021 to 18.01.2021

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2019	2021	2022	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1264	1266	1267	
4	Weight of saturated surface dry aggregate in air	W_3 g	2013	2015	2016	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	749	749	749	
6	Weight of oven dried aggregate	W_4 g	2002	2004	2006	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.673	2.676	2.678	2.676
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.713	2.715	2.714	2.714
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.55%	0.55%	0.50%	0.53%

Comments:
→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)

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Lab No.: CQCE/BBMP/SSK/W.No.16/2020-2021

16.01.2021

Aggregate Gradation Test

IS : 2386 Part I

Client	: Executive Engineer, R R Nagara Division, BBMP, Bangalore.
Agency	: Sri. S Santhosh Kumar, Contractor, Bangalore.
Name of the Work	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
BIS Code	:IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.01.2021

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	408	8.16	8.16	91.84	90 - 100	
9.5	473	9.46	17.62	82.38	70 - 88	
4.75	616	12.32	29.94	70.06	53 - 71	
2.36	679	13.58	43.52	56.48	42 - 58	
1.18	524	10.48	54.00	46.00	34 - 48	
0.600	531	10.62	64.62	35.38	26 - 38	
0.300	484	9.68	74.30	25.70	18 - 28	
0.150	312	6.24	80.54	19.46	12 - 20	
0.075	564	11.28	91.82	8.18	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	428	8.56	8.56	91.44	90 - 100	
9.5	509	10.18	18.74	81.26	70 - 88	
4.75	687	13.74	32.48	67.52	53 - 71	
2.36	531	10.62	43.10	56.90	42 - 58	
1.18	506	10.12	53.22	46.78	34 - 48	
0.600	549	10.98	64.20	35.80	26 - 38	
0.300	561	11.22	75.42	24.58	18 - 28	
0.150	371	7.42	82.84	17.16	12 - 20	
0.075	561	11.22	94.06	5.94	4 - 10	

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Job No.: CQCE/BBMP/MSR/38/2020-21

19.01.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Executive Engineer, R R Nagara Division, BBMP,Bangalore.
AGENCY	: Sri. S Santhosh Kumar, Contractor, Bangalore.
NAME OF THE WORK	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
SAMPLE ID	:Hot Mix Plant, Bangalore
DATE OF TESTING	19.01.2021

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.3	472.7
3. Weight of Asphalt and Mineral matter Extracted, g	27.7	27.3
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.7	27.3
7. Bitumen content in %	5.54	5.46
8. Average	5.50	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	11.5	11.5	2.4	97.6	90 - 100
9.5	68.4	79.9	16.9	83.1	70 - 88
4.75	91.7	171.6	36.3	63.7	53 - 71
2.36	46.5	218.1	46.2	53.8	42 - 58
1.18	41.3	259.4	54.9	45.1	34 - 48
0.600	51.6	311	65.8	34.2	26 - 38
0.300	42.9	353.9	74.9	25.1	18 - 28
0.150	40.6	394.5	83.5	16.5	12 - 20
0.075	51.5	446	94.4	5.6	4 - 10

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	12.2	12.2	2.6	97.4	90 - 100
9.5	69.5	81.7	17.3	82.7	70 - 88
4.75	90.7	172.4	36.5	63.5	53 - 71
2.36	45.4	217.8	46.1	53.9	42 - 58
1.18	41.3	259.1	54.8	45.2	34 - 48
0.600	52.8	311.9	66.0	34.0	26 - 38
0.300	50.6	362.5	76.7	23.3	18 - 28
0.150	32.1	394.6	83.5	16.5	12 - 20
0.075	49.9	444.5	94.0	6.0	4 - 10

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Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 20.01.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Executive Engineer, R R Nagara Division, BBMP,Bangalore.
AGENCY	: Sri. S Santhosh Kumar, Contractor, Bangalore.
NAME OF THE WORK	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
SAMPLE ID	:Hot Mix Plant, Bangalore
DATE OF TESTING	20.01.2021

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.9	472.4
3. Weight of Asphalt and Mineral matter Extracted, g	27.1	27.6
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.1	27.6
7. Bitumen content in %	5.42	5.52
8. Average	5.47	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	13.5	13.5	2.9	97.1	90 - 100
9.5	64.7	78.2	16.5	83.5	70 - 88
4.75	91.8	170	35.9	64.1	53 - 71
2.36	44.6	214.6	45.4	54.6	42 - 58
1.18	42.3	256.9	54.3	45.7	34 - 48
0.600	39.8	296.7	62.7	37.3	26 - 38
0.300	51.7	348.4	73.7	26.3	18 - 28
0.150	31.6	380	80.4	19.6	12 - 20
0.075	51.5	431.5	91.2	8.8	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	12.9	12.9	2.7	97.3	90 - 100
9.5	65.6	78.5	16.6	83.4	70 - 88
4.75	94.1	172.6	36.5	63.5	53 - 71
2.36	41.8	214.4	45.4	54.6	42 - 58
1.18	43.4	257.8	54.6	45.4	34 - 48
0.600	52.7	310.5	65.7	34.3	26 - 38
0.300	50.6	361.1	76.4	23.6	18 - 28
0.150	31.4	392.5	83.1	16.9	12 - 20
0.075	51.6	444.1	94.0	6.0	4 - 10

Note:
1. This test report should not be reproduced except in full, without written approval of the laboratory
2. The results indicated above are based on the tests carried out on the samples received in the laboratory
3. Any Query regarding the report must be reported within 30 days from the date of testing

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

Corporate Off.: No. 133, Bhuvaneshwarinagar, Doddabasti Main Road, Bangalore 560 056.
Contact: 8553518550, 080-23240644 Email: civilqualityconsultants@gmail.com

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CIVIL QUALITY CONSULTANTS & ENGINEERS
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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021

Date: 19.01.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**: Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency	:	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	:	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	19.01.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.45	10.76	9 Kn (min)
2	Marshal flow, mm	3.19	3.35	2 – 4
3	Percent air voids in Mineral Aggregate	13.28	14.37	13 – 15
4	Voids in Compacted Mix	3.17	4.85	3 – 6
5	Percent Voids filled with Bitumen	67.91	72.34	65 - 75
6	Density, g/cc	2.26	2.27	--

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021

Date: 20.01.2021

TEST REPORT ON STABILITY OF MIX

Client	:	: **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency	:	: **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	:	: Pot hole filling in Jalahalli surrounding areas of Bhovi Colony Khata nagara Sidhartha nagara Jalahalli colony in ward no 16 Jalahalli, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	20.01.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.11	10.06	9 Kn (min)
2	Marshal flow, mm	2.48	3.67	2 – 4
3	Percent air voids in Mineral Aggregate	13.97	14.13	13 – 15
4	Voids in Compacted Mix	3.25	5.42	3 – 6
5	Percent Voids filled with Bitumen	67.32	72.81	65 - 75
6	Density, g/cc	2.27	2.25	--

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